

DAFTAR PUSTAKA

- Aafrin Hazaana, S., Joseph, A., Selvasekarapandian, S., Meera Naachiyar, R., Vengadesh Krishna, M., dan Muniraj Vignesh, N. (2023). Development and characterization of biopolymer electrolyte based on gellan gum (GG) with lithium chloride (LiCl) for the application of electrochemical devices. *Polymer Bulletin*, **80**(5), 5291-5311.
- Abdel-Ghaffar, A., dan Ali, H. (2022). Effect of gamma radiation on the properties of novel polyvinyl alcohol/carboxymethyl cellulose/citric acid/glycerol bioblend film. *Polymer Bulletin*, **79**(7), 5105-5119.
- Abdulkhani, A., Marvast, E. H., Ashori, A., Hamzeh, Y., dan Karimi, A. N. (2013). Preparation of cellulose/polyvinyl alcohol biocomposite films using 1-n-butyl-3-methylimidazolium chloride. *International journal of biological macromolecules*, **62**, 379-386.
- Abdullaevich, Y. S., Ergashovich, Y. K., Abdukhalilovich, S. A., dan Shavkat O'g'li, G. I. (2022). Synthesis and characterization of sodium-carboxymethylcellulose from cotton, powder, microcrystalline and nanocellulose. *Polymer Engineering & Science*, **62**(3), 677-686.
- Alabi, F., Lajide, L., Ajayi, O., Adebayo, A., Emmanuel, S., dan Fadeyi, A. (2020). Synthesis and characterization of carboxymethyl cellulose from *Musa paradisiaca* and *Tithonia diversifolia*. *African Journal of Pure and Applied Chemistry*, **14**(1), 9-23.
- Aziz, S. B., Nofal, M. M., Abdulwahid, R. T., O. Ghareeb, H., Dannoun, E. M., M. Abdullah, R., Hamsan, M., dan Kadir, M. (2021). Plasticized sodium-ion conducting PVA based polymer electrolyte for electrochemical energy storage—EEC modeling, transport properties, and charge-discharge characteristics. *Polymers*, **13**(5), 789-803.
- Bisht, S. S., Pandey, K., Joshi, G., dan Naithani, S. (2017). New route for carboxymethylation of cellulose: synthesis, structural analysis and properties. *Cellul. Chem. Technol*, **51**(7-8), 609-619.
- Candido, R., dan Gonçalves, A. (2016). Synthesis of cellulose acetate and carboxymethylcellulose from sugarcane straw. *Carbohydrate polymers*, **152**, 679-686.
- Capanema, N. S., Mansur, A. A., De Jesus, A. C., Carvalho, S. M., De Oliveira, L. C., dan Mansur, H. S. (2018). Superabsorbent crosslinked carboxymethyl cellulose-PEG hydrogels for potential wound dressing applications. *International journal of biological macromolecules*, **106**, 1218-1234.



ruddin, N., dan Ahmad, M. (2019). Preparation and Swelling C Hydrogel as Potential Superabsorbent. *Pertanika Journal of echnology*, **27**(1), 1-12.

., Malik, A. A., dan Verma, A. K. (2023). Lignin depolymerization ation. *BioEnergy Research*, **16**(3), 1264-1279.

ruru, S. T., Ariva Asta, V., Al Razi Hidayat, R., Siti Mawarni, R.,

- Marlina, A., Yulianti, E., Sri Handayani, A., Hikmat, Adawiyah Siregar, R., dan Heliawati, L. (2024). Isolation, Modification, and Characterization of Local Indonesia's Sugarcane Bagasse Cellulose for Dye-Adsorbent Application. *ChemistrySelect*, **9**(2), 2801-2812.
- Costa, E. M., Pereira, C. F., Ribeiro, A. A., Casanova, F., Freixo, R., Pintado, M., dan Ramos, O. L. (2022). Characterization and evaluation of commercial carboxymethyl cellulose potential as an active ingredient for cosmetics. *Applied Sciences*, **12**(13), 6550-6560.
- D'acierno, F., Hamad, W. Y., Michal, C. A., dan Maclachlan, M. J. (2020). Thermal degradation of cellulose filaments and nanocrystals. *Biomacromolecules*, **21**(8), 3374-3386.
- Demitri, C., Del Sole, R., Scalera, F., Sannino, A., Vasapollo, G., Maffezzoli, A., Ambrosio, L., dan Nicolais, L. (2008). Novel superabsorbent cellulose-based hydrogels crosslinked with citric acid. *Journal of Applied Polymer Science*, **110**(4), 2453-2460.
- Duan, S., Kai, T., Saito, T., Yamazaki, K., dan Ikeda, K. (2014). Effect of cross-linking on the mechanical and thermal properties of poly (amidoamine) dendrimer/poly (vinyl alcohol) hybrid membranes for CO₂ separation. *Membranes*, **4**(2), 200-209.
- El-Sakhawy, M., Tohamy, H.-a. S., Salama, A., dan Kamel, S. (2019). Thermal properties of carboxymethyl cellulose acetate butyrate. *Cellul. Chem. Technol*, **53**(7-8), 667-675.
- Elmore, C. T., Seidler, M. E., Ford, H. O., Merrill, L. C., Upadhyay, S. P., Schneider, W. F., dan Schaefer, J. L. (2018). Ion transport in solvent-free, crosslinked, single-ion conducting polymer electrolytes for post-lithium ion batteries. *Batteries*, **4**(2), 1-28.
- Ferdiansyah, M. K. (2013). *Isolasi Selulosa Dan Sintesis Karboksi Metil Selulosa (Cmc) Dari Pelepah Kelapa Sawit*, Universitas Gadjah Mada.
- Ghorpade, V. S., Yadav, A. V., Dias, R. J., Mali, K. K., Pargaonkar, S. S., Shinde, P. V., dan Dhane, N. S. (2018). Citric acid crosslinked carboxymethylcellulose-poly (ethylene glycol) hydrogel films for delivery of poorly soluble drugs. *International journal of biological macromolecules*, **118**, 783-791.
- Hadad, S., Hamrahjoo, M., Dehghani, E., Salami-Kalajahi, M., Eliseeva, S. N., Moghaddam, A. R., dan Roghani-Mamaqani, H. (2022). Cellulose-based solid and gel polymer electrolytes with super high ionic conductivity and charge capacity for high performance lithium ion batteries. *Sustainable Materials and Technologies*, **33**, 500-503.



o, A., dan Bahrudin. (2020). Pembuatan Carboxymethyl (AC) dari Pelepah Kelapa Sawit. *Jurnal Sains dan Ilmu Terapan*,

N. S., Isa, I. M., Bakar, S. A., Mustafar, S., Mamat, M., Hussein, Sharif, S. N. M. (2020). Carboxymethylcellulose-coated layered hydroxide nanocomposite for controlled release of 3-(4-yl) propionic acid. *Arabian Journal of Chemistry*, **13**(2), 3974-

3987.

- Hernández, M., Leyva, G., Magaña, J. J., Guzmán-Vargas, A., Felipe, C., Lara, V., dan Lima, E. (2019). New copolymers as hosts of ribosomal RNA. *BMC chemistry*, **13**, 1-12.
- Huang, C. M., Chia, P. X., Lim, C. S., Nai, J. Q., Ding, D. Y., Seow, P. B., Wong, C. W., dan Chan, E. W. (2017). Synthesis and characterisation of carboxymethyl cellulose from various agricultural wastes. *Cellul. Chem. Technol*, **51(7-8)**, 665-672.
- Jumaah, F., Mobarak, N., Ahmad, A., Ghani, M., dan Rahman, M. (2015). Derivative of iota-carrageenan as solid polymer electrolyte. *Ionics*, **21**, 1311-1320.
- Kaewprachu, P., Jaisan, C., Rawdkuen, S., Tongdeesoontorn, W., dan Klunklin, W. (2022). Carboxymethyl cellulose from Young Palmyra palm fruit husk: Synthesis, characterization, and film properties. *Food Hydrocolloids*, **124**, 107277-107279.
- Kamar, I., Yuniarni, D., dan Emilia, R. (2024). Isolasi Carboxymethyl Cellulose (Cmc) Dengan Memanfaatkan Limbah Tongkos Sawit Sebagai Pengganti Cmc Komersil. *Jurnal Inovasi Teknik Kimia*, **9(1)**, 17-23.
- Kamilah, H. (2020). *Karakterisasi membran solid polymer electrolyte berbasis cellulose/libob/il dengan additive cmc/pva untuk aplikasi baterai li-ion*, Perpustakaan Fakultas Sains dan Teknologi UIN Jakarta.
- Kasrawati, K., Sihotang, S. H., dan Mu'alim, A. (2023). Penentuan Berat Molekul dan Derajat Polimerisasi Selulosa yang Berasal dari Tongkol Jagung (*Zea mays* L) dengan Metode Viskositas. *Jurnal Serambi Akademica*, **11(5)**, 527-534.
- Kono, H., Oshima, K., Hashimoto, H., Shimizu, Y., dan Tajima, K. (2016). NMR characterization of sodium carboxymethyl cellulose: Substituent distribution and mole fraction of monomers in the polymer chains. *Carbohydrate Polymers*, **146**, 1-9.
- Liew, J. W. Y., Loh, K. S., Ahmad, A., Lim, K. L., dan Wan Daud, W. R. (2017). Synthesis and characterization of modified kappa-carrageenan for enhanced proton conductivity as polymer electrolyte membrane. *Plos one*, **12(9)**, 185313-185318.
- M. Hadi, J., B. Aziz, S., M. Nofal, M., Hussein, S. A., Hafiz, M. H., Brza, M. A., Abdulwahid, R. T., Kadir, M. F., dan Woo, H. J. (2020). Electrical, dielectric property and electrochemical performances of plasticized silver ion-conducting chitosan-based polymer nanocomposites. *Membranes*, **10(7)**, 151-160.
- Madhu, A., Suleman, A. S., Wahyudi, S. T., dan Rifai, A. (2022). Enhancing Ionic of Carboxymethyl Cellulose-Lithium Perchlorate with Citric Acid as Solid Polymer Electrolytes for Lithium Polymer. *International Journal of Renewable Energy Development*, **11(4)**, 1-12.
1. Sintesis dan Karakterisasi Carboxymethyl Cellulose (CMC) a Eceng Gondok (*Eichhornia crassipes*). *UNESA Journal of* **(1)**, 1-12.



- Masrullita, M., Meriatna, M., Zulmiardi, Z., Safrwardy, F., Auliani, A., dan Nurlaila, R. (2021). Pemanfaatan jerami padi (*oryza sativa* L.) sebagai bahan baku dalam pembuatan CMC (carboximetil cellulose). *Jurnal Rekayasa Proses*, **15**(2), 194-201.
- Masrullita, M., Nurlaila, R., Zulmiardi, Z., Safrwardy, F., Auliani, A., dan Meriatna, M. (2022). Synthesis carboxyl methyl cellulose (CMC) from rice straw (*Oryza Sativa* L.) waste. *International Journal of Engineering, Science and Information Technology*, **2**(1), 24-29.
- Mazuki, N., Majeed, A. A., Nagao, Y., dan Samsudin, A. (2020). Studies on ionics conduction properties of modification CMC-PVA based polymer blend electrolytes via impedance approach. *Polymer testing*, **81**, 223-234.
- Melro, E., Filipe, A., Sousa, D., Medronho, B., dan Romano, A. (2021). Revisiting lignin: A tour through its structural features, characterization methods and applications. *New Journal of Chemistry*, **45**(16), 6986-7013.
- Moussa, I., Khiari, R., Moussa, A., Belgacem, M. N., dan Mhenni, M. F. (2019). Preparation and characterization of carboxymethyl cellulose with a high degree of substitution from agricultural wastes. *Fibers and Polymers*, **20**, 933-943.
- Ndruru, S. (2019). *Pengembangan biopolimer elektrolit padat berbasis paduan turunan selulosa berisi cairan ion untuk aplikasi baterai ion litium disertasi*, Dissertation Institut Teknologi Bandung, 305-350.
- Ndruru, S. T. C. L., Pramono, E., Wahyuningrum, D., Bundjali, B., dan Arcana, I. M. (2021). Preparation and characterization of biopolymer blend electrolyte membranes based on derived celluloses for lithium-ion batteries separator. *Bulletin of Materials Science*, **44**, 1-15.
- Ndruru, S. T. C. L., Syamsaizar, A. D., Hermanto, S., Sitanggang, B. C., Tawa, B. D., Kareem, A. A., Hayati, A. T., Ramadhoni, B. F., Sofyan, M. I., dan Annas, D. (2024). Synthesis of carboxymethyl cellulose from coconut fibers and its application as solid polymer electrolyte membranes. *Journal of Applied Polymer Science*, **141**(28), 556-569.
- Ndruru, S. T. C. L., Wahyuningrum, D., Bundjali, B., dan Arcana, I. M. (2019). Green synthesis of [EMIm] Ac ionic liquid for plasticizing mc-based biopolymer electrolyte membranes. *Bulletin of Chemical Reaction Engineering & Catalysis*, **14**(2), 345-357.
- Ndruru, S. T. C. L., Widiarto, S., Pramono, E., Wahyuningrum, D., Bundjali, B., dan Arcana, I. M. (2022a). The Influences of [EMIm] Ac Ionic Liquid for the Characteristics of Li-Ion Batteries' Solid Biopolymer Blend Electrolyte Based on Cellulose Derivatives of MC/CMC Blend. *Macromolecular Chemistry and* **(3)**, 349-362.
- Widiarto, S., Pramono, E., Wahyuningrum, D., Bundjali, B., dan I. (2022b). Modification of Nias' Cacao Pod Husk Cellulose boxymethylation Stages by Using MAOS Method and Its as Li-ion Batteries' Biopolymer Electrolyte Membrane. *lect*, **7**(44), 2022-2051.



- Pongchaiphol, S., Preechakun, T., Raita, M., Champreda, V., dan Laosiripojana, N. (2021). Characterization of Cellulose–Chitosan-Based Materials from Different Lignocellulosic Residues Prepared by the Ethanosolv Process and Bleaching Treatment with Hydrogen Peroxide. *ACS omega*, **6(35)**, 22791-22802.
- Pujokaroni, A. S., Marseno, D. W., dan Pranoto, Y. (2022). Sintesis dan karakterisasi sodium karboksimetil selulosa dari serabut kelapa sawit. *Journal of Tropical AgriFood*, **3(2)**, 101-113.
- Rahmi, S. L., Adlim, M., Lelifajri, N. a. Z., dan Fathana, H. (2023). *Pemanfaatan Selulosa dari Bahan Alam Pada Pembuatan Komposit Kitosan*: Syiah Kuala University Press.
- Ravindrachary, V., Sanjeev, G., dan Praveena, S. (2018). Electron beam induced modifications in the microstructure of PVA/Li2B4O7 polymer films: Positron annihilation study. *Radiation Physics and Chemistry*, **151**, 69-76.
- Saadiah, M., Nagao, Y., dan Samsudin, A. (2021). Enhancement on protonation (H+) with incorporation of flexible ethylene carbonate in CMC–PVA–30 wt% NH4NO3 film. *International Journal of Hydrogen Energy*, **46(33)**, 17231-17245.
- Saadiah, M., Zhang, D., Nagao, Y., Muzakir, S., dan Samsudin, A. (2019). Reducing crystallinity on thin film based CMC/PVA hybrid polymer for application as a host in polymer electrolytes. *Journal of Non-Crystalline Solids*, **511**, 201-211.
- Safitri, D., Rahim, E. A., Prismawiryanti, P., dan Sikanna, R. (2017). Sintesis karboksimetil selulosa (CMC) dari selulosa kulit durian (*Durio zibethinus*). *KOVALEN: Jurnal Riset Kimia*, **3(1)**, 58-68.
- Samsudin, A., Lai, H., dan Isa, M. (2014). Biopolymer materials based carboxymethyl cellulose as a proton conducting biopolymer electrolyte for application in rechargeable proton battery. *Electrochimica Acta*, **129**, 1-13.
- Saputra, H., Siregar, A. L., Oktavia, R. Y., dan Simatupang, D. F. (2023). Sintesis Biooil dari Limbah Pelepah Kelapa Sawit Berbasis Metode Pirolisis. *REACTOR: Journal of Research on Chemistry and Engineering*, **4(1)**, 12-18.
- Saroj, A., Krishnamoorthi, S., dan Singh, R. (2017). Structural, thermal and electrical transport behaviour of polymer electrolytes based on PVA and imidazolium based ionic liquid. *Journal of Non-Crystalline Solids*, **473**, 87-95.
- Sharmin, N., Rosnes, J. T., Prabhu, L., Böcker, U., dan Sivertsvik, M. (2022). Effect of citric acid cross linking on the mechanical, rheological and barrier properties of chitosan. *Molecules*, **27(16)**, 5105-5118.
- Shofiana Khoirani, N. (2017). *Optimasi Nilai Konduktivitas Ionik Elektrolit Polimer n-Zro2 Dengan Penambahan Liclo4*, Universitas Mataram.
- M., dan Kadir, M. Plasticized and plasticizer free lithium acetate vinyl alcohol–chitosan blend solid polymer electrolytes: studies. *Presented at Journal of Physics: Conference Series*.
- , N., dan Saragih, G. (2019). Pengaruh kosentrasi NaOH pada α selulosa dari pelepah kelapa sawit. *Ready Star*, **2(1)**, 103-



108.

- Silsia, D., Efendi, Z., dan Timotius, F. (2018). Karakterisasi karboksimetil selulosa (cmc) dari pelepah kelapa sawit. *Jurnal Agroindustri*, **8(1)**, 53-61.
- Siregar, F. K. (2018). *Pembuatan dan Karakterisasi Film Berbasis Karboksimetil Selulosa dari Daun Gebang (Corypha utan), Polivinil Alkohol dan Asam Sitrat untuk Aplikasi Antibakteri*, Universitas Sumatera Utara.
- Sirviö, J. A., Kantola, A. M., dan Ämmälä, A. (2023). Cellulose nanofibers from nonbleached and hydrogen peroxide bleached acidic thiourea treated sawdust. *Journal of Cleaner Production*, **423**, 138-156.
- Stavrinidou, E., Sessolo, M., Winther-Jensen, B., Sanaur, S., dan Malliaras, G. G. (2014). A physical interpretation of impedance at conducting polymer/electrolyte junctions. *Aip Advances*, **4(1)**, 1-12.
- Sunardi, S., Noviyanti, N., Istikowati, W. T., Nisa, K., dan Anwar, M. (2021). Analisis Komponen Serat Pelepah Sagu (Metroxylon Sago) Dan Kajian Morfologi Selulosanya Setelah Oksidasi Menggunakan Amonium Persulfat. *Jurnal Sains dan Terapan Kimia* **15(1)**, 48-63.
- Suppiah, K., Leng, T. P., Husseinsyah, S., Rahman, R., Keat, Y. C., dan Heng, C. (2019). Thermal properties of carboxymethyl cellulose (CMC) filled halloysite nanotube (HNT) bio-nanocomposite films. *Materials Today: Proceedings*, **16**, 1611-1616.
- Wijana, S., Rahmah, N. L., dan Ansory, D. (2013). Studi Proses Pulping Serat Pelepah dan Serat Kulit Buah Nipah (*Nypa fruticans*) dengan Metode Kimia (Kajian Konsentrasi Larutan NaOH). *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, **2(1)**, 37-46.
- Wongvitvichot, W., Pithakratanayothin, S., Wongkasemjit, S., dan Chaisuwan, T. (2021). Fast and practical synthesis of carboxymethyl cellulose from office paper waste by ultrasonic-assisted technique at ambient temperature. *Polymer Degradation and Stability*, **184**, 109-123.
- Worku, L. A., Bachheti, R. K., dan Tadesse, M. G. (2022). Isolation and characterization of natural cellulose from *Oxytenanthera abyssinica* (Lowland Ethiopian Bamboo) using alkali peroxide bleaching stages followed by aqueous chlorite in buffer solution. *International Journal of Polymer Science*, **22**, 1-15.
- Xiao, S., Yang, Y., Li, M., Wang, F., Chang, Z., Wu, Y., dan Liu, X. (2014). A composite membrane based on a biocompatible cellulose as a host of gel polymer electrolyte for lithium ion batteries. *Journal of power sources*, **270**, 53-58.



N., Wahyuni, H. S., Sigalingging, R. T., dan Sibarani, T. (2019). alkalization on carboxymethyl cellulose synthesis from stem and e of banana. *Open Access Macedonian Journal of Medical* **22**, 3874-3884.

ams, H., Farquhar, G. D., dan Hocart, C. H. (2010). The use of lance stable isotopic ratios to indicate the presence of oxygen-chemical linkages between cellulose and lignin in plant cell walls.

Phytochemistry, **71(8-9)**, 982-993.

- Zikrillah, M., Muharja, M., Darmayanti, R. F., Batuthoh, M. W. I., dan Khamil, A. I. (2023). Metode baru perhitungan viskositas intrinsik dan berat molekul polihidroksialkanoat untuk produksi plastik biodegradable. *Jurnal Penelitian IPTEKS*, **8(2)**, 188-195.
- Zulkifli, A., Saadiah, M., Mazuki, N., dan Samsudin, A. (2020). Characterization of an amorphous materials hybrid polymer electrolyte based on a LiNO₃-doped, CMC-PVA blend for application in an electrical double layer capacitor. *Materials Chemistry and Physics*, **253**, 123-212.

